

CLAIMS

1. A method of framing a payload, comprising:
delimiting frame boundaries of a payload;
calculating a value as a function of a subset of the payload; and
appending the value to the payload within the frame boundaries.
2. The method of claim 1 wherein the frame delimitation comprises appending a preamble to the beginning of the payload, the preamble having the value.
3. The method of claim 2 wherein the payload comprises a plurality of bytes, and the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble.
4. The method of claim 3 further comprising disposing in the preamble a length field which indicates the number of bytes in the payload, and wherein the calculation of the value is further a function of the length field.
5. The method of claim 4 wherein the calculation of the value comprises exclusive or'ing the subset of the payload and the length field.
6. The method of claim 5 further comprising calculating a second value as a function of a second subset of the payload, and appending the second value to the end of the payload within the frame boundaries.
7. The method of claim 6 wherein the second subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the last byte of the payload, and wherein the calculation of the second value comprises exclusive or'ing the second subset of the payload and the length field.
8. The method of claim 1 wherein the frame delimitation comprises appending the value to the end of the payload.

9. The method of claim 8 wherein the payload comprises a plurality of bytes, and the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the last byte of the payload.

10. The method of claim 9 wherein the frame delimitation comprises appending a preamble having a length field to the beginning of the payload, the calculation of the value further being a function of the length field.

11. The method of claim 10 wherein the calculation of the value comprises exclusive or'ing the subset of the payload and the length field.

12. The method of claim 1 wherein the payload comprises a maximum number of bytes, and wherein the frame delimitation comprises appending a preamble to the beginning of the payload, the preamble comprising a start flag having a first byte, the value following the start flag, and a length field following the value, the length field indicating the number of bytes in the payload, and wherein the value and a portion of the length field comprises a second byte, the second byte being limited to a subset of byte values due to the maximum number of bytes in the payload, the method further comprising selecting a start flag having a byte value different from the subset of byte values available for the second byte.

13. The method of claim 12 wherein the value comprises 5-bits and the length field comprises at least 3-bits, the second byte comprising the 5-bit value followed by the three most significant bits of the length field.

14. A method of determining a valid payload in a frame, comprising:
identifying a frame having a payload with a first value appended thereto;
calculating a second value as a function of a subset of the payload;
comparing the second value to the first value; and
detecting a valid payload as a function of the comparison.

15. The method of claim 14 wherein the frame identification comprises detecting a start flag.

16. The method of claim 14 wherein the payload comprises a plurality of bytes, the method further comprising identifying a length field in the frame indicating the number of bytes in the payload.

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17. The method of claim 16 wherein the calculation of the second value is further a function of the length field.

18. The method of claim 17 wherein the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the calculation of the second value comprises exclusive or'ing the subset of the payload and the length field.

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19. The method of claim 16 further comprising determining whether the number of payload bytes indicated by the length field exceeds a threshold, the valid frame detection further being a function of the length field determination.

20. The method of claim 14 wherein the frame including the payload comprises a plurality of bytes, the method further comprising receiving the frame in a serial byte stream, and determining whether all the payload bytes are received within a predetermined time from receipt of the first payload byte, the valid frame detection further being a function of the payload byte determination.

21. The method of claim 20 further comprising identifying a length field in the frame indicating the number of bytes in the payload, the payload byte determination being a function of the length field indication.

22. The method of claim 14 wherein the frame including the payload comprises a plurality of bytes, the method further comprising receiving the frame in a serial byte stream, counting the number of payload bytes received within a predetermined time, and declaring an invalid frame if the payload byte count within the predetermined time is below a threshold.

23. The method of claim 22 further comprising recounting the number of payload bytes received within a second predetermined time if the payload byte within the predetermined time exceeds the threshold.

5 24. The method of claim 14 wherein the first value is appended to the beginning of the payload, the frame further comprising a third value appended to the end of the payload, the method further comprising calculating a fourth value as a function of a second subset of the payload, and comparing the fourth value to the third value, the valid payload detection being a function of both the comparison of the first value to the second value and the
10 comparison of the third value to the fourth value.

25. The method of claim 24 wherein valid payload detection further comprises confirming a stop flag within the frame immediately following the third value.

15 26. The method of claim 24 wherein the payload comprises a plurality of bytes, the method further comprising identifying a length field in the frame indicating the number of bytes in the payload.

20 27. The method of claim 26 wherein the calculation of the second value and the calculation of the fourth value are both further a function of the length field.

25 28. The method of claim 27 wherein the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the second subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble and the last byte of the payload.

29. The method of claim 28 wherein calculation of the second value comprises exclusive or'ing the subset of the payload and the length field, and the calculation of the fourth value comprises exclusive or'ing the second subset of the payload and the length field.

30 30. Computer-readable media embodying a program of instructions executable by a computer to perform a method of framing a payload, the method comprising:

delimiting frame boundaries of a payload;
calculating a value as a function of a subset of the payload; and
appending the value to the payload within the frame boundaries.

5 31. The computer-readable media of claim 30 wherein the frame delimitation comprises appending a preamble to the beginning of the payload, the preamble having the value.

10 32. The computer-readable media of claim 31 wherein the payload comprises a plurality of bytes, and the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble.

15 33. The computer-readable media of claim 32 wherein the method further comprises disposing in the preamble a length field which indicates the number of bytes in the payload, and wherein the calculation of the value is further a function of the length field.

20 34. The computer-readable media of claim 33 wherein the calculation of the value comprises exclusive or'ing the subset of the payload and the length field.

25 35. The computer-readable media of claim 34 wherein the method further comprises calculating a second value as a function of a second subset of the payload, and appending the second value to the end of the payload within the frame boundaries.

30 36. The computer-readable media of claim 35 wherein the second subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the last byte of the payload, and wherein the calculation of the second value comprises exclusive or'ing the second subset of the payload and the length field.

35 37. The computer-readable media of claim 30 wherein the frame delimitation comprises appending the value to the end of the payload.

38. The computer-readable media of claim 37 wherein the payload comprises a plurality of bytes, and the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the last byte of the payload.

5 39. The computer-readable media of claim 38 wherein the frame delimitation comprises appending a preamble having a length field to the beginning of the payload, the calculation of the value further being a function of the length field.

10 40. The computer-readable media of claim 39 wherein the calculation of the value comprises exclusive or'ing the subset of the payload and the length field.

15 41. The computer-readable media of claim 30 wherein the payload comprises a maximum number of bytes, and wherein the frame delimitation comprises appending a preamble to the beginning of the payload, the preamble comprising a start flag having a first byte, the value following the start flag, and a length field following the value, the length field indicating the number of bytes in the payload, and wherein the value and a portion of the length field comprises a second byte, the second byte being limited to a subset of byte values due to the maximum number of bytes in the payload, the method further comprising selecting a start flag having a byte value different from the subset of byte values available for the
20 second byte.

25 42. The computer-readable media of claim 41 wherein the value comprises 5-bits and the length field comprises at least 3-bits, the second byte comprising the 5-bit value followed by the three most significant bits of the length field.

43. Computer-readable media embodying a program of instructions executable by a computer to perform a method of determining a valid payload in a frame, the method comprising:

30 identifying a frame having a payload with a first value appended thereto;
calculating a second value as a function of a subset of the payload;
comparing the second value to the first value; and
detecting a valid payload as a function of the comparison.

44. The computer-readable media of claim 43 wherein the frame identification comprises detecting a start flag.

5 45. The computer-readable media of claim 43 wherein the payload comprises a plurality of bytes, the method further comprising identifying a length field in the frame indicating the number of bytes in the payload.

10 46. The computer-readable media of claim 45 wherein the calculation of the second value is further a function of the length field.

15 47. The computer-readable media of claim 46 wherein the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the calculation of the second value comprises exclusive or'ing the subset of the payload and the length field.

20 48. The computer-readable media of claim 45 wherein the method further comprises determining whether the number of payload bytes indicated by the length field exceeds a threshold, the valid frame detection further being a function of the length field determination.

25 49. The computer-readable media of claim 43 wherein the frame including the payload comprises a plurality of bytes, the method further comprising receiving the frame in a serial byte stream, and determining whether all the payload bytes are received within a predetermined time from receipt of the first payload byte, the valid frame detection further being a function of the payload byte determination.

30 50. The computer-readable media of claim 49 wherein the method further comprises identifying a length field in the frame indicating the number of bytes in the payload, the payload byte determination being a function of the length field indication.

51. The computer-readable media of claim 43 wherein the frame including the payload comprises a plurality of bytes, the method further comprising receiving the frame in a serial byte stream, counting the number of payload bytes received within a predetermined time, and declaring an invalid frame if the payload byte count within the predetermined time is below a threshold.

52. The computer-readable media of claim 51 wherein the method further comprises recounting the number of payload bytes received within a second predetermined time if the payload byte within the predetermined time exceeds the threshold.

53. The computer-readable media of claim 43 wherein the first value is appended to the beginning of the payload, the frame further comprising a third value appended to the end of the payload, the method further comprising calculating a fourth value as a function of a second subset of the payload, and comparing the fourth value to the third value, the valid payload detection being a function of both the comparison of the first value to the second value and the comparison of the third value to the fourth value.

54. The computer-readable media of claim 53 wherein valid payload detection further comprises confirming a stop flag within the frame immediately following the third value.

55. The computer-readable media of claim 53 wherein the payload comprises a plurality of bytes, the method further comprising identifying a length field in the frame indicating the number of bytes in the payload.

56. The computer-readable media of claim 55 wherein the calculation of the second value and the calculation of the fourth value are both further a function of the length field.

57. The computer-readable media of claim 56 wherein the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the

second subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble and the last byte of the payload.

58. The computer-readable media of claim 57 wherein calculation of the second value comprises exclusive or'ing the subset of the payload and the length field, and the calculation of the fourth value comprises exclusive or'ing the second subset of the payload and the length field.

59. A communications device, comprising:
a processor configured to delimit frame boundaries of a payload, calculate a value as a function of a subset of the payload, and append the value to the payload within the frame boundaries; and
a transmitter configured to transmit the processed frame.

60. The communications device of claim 59 wherein the processor is further configured to append a preamble to the beginning of the payload, the preamble having the value.

61. The communications device of claim 60 wherein the processor is further configured to calculate a second value as a function of a second subset of the payload and append the second value to the end of the payload within the frame boundaries.

62. The communications device of claim 61 wherein the payload comprises a plurality of bytes, the processor further configured to dispose in the preamble a length field which indicates the number of bytes in the payload, and to calculate the second value as a function of the second subset of the payload and the length field.

63. The communications device of claim 62 wherein the second subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the last byte of the payload, the processor further being configured to calculate the second value by exclusive or'ing the second subset of the payload and the length field.

64. The communications device of claim 59 wherein the payload comprises a plurality of bytes, the processor further being configured to dispose in the preamble a length field which indicates the number of bytes in the payload, and to calculate the value as a function of the subset of the payload and the length field.

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65. The communications device of claim 64 wherein the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, the processor further being configured to calculate the value by exclusive or'ing the subset of the payload and the length field.

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66. The communications device of claim 59 wherein the transmitter comprises a wireless transmitter.

67. The communications device of claim 66 wherein the transmitter comprises a code division multiple access transmitter.

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68. The communications device of claim 59 further comprising a receiver configured to receive a second frame having a second payload with a second value appended thereto, the processor further being configured to calculate a third value as a function of a second subset of the second payload, compare the third value to the second value, and detect a valid second payload as a function of the comparison.

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69. The communications device of claim 68 wherein the receiver comprises a wireless receiver.

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70. The communications device of claim 69 wherein the receiver comprises a code division multiple access receiver.

71. A communications device, comprising:
a receiver configured to receive frame having a payload with a first value appended thereto; and

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a processor configured to calculate a second value as a function of a subset of the payload, compare the second value to the first value, and detect a valid payload as a function of the comparison.

5 72. The communications device of claim 71 wherein the payload comprises a plurality of bytes, the processor further being configured to identify a length field in the frame indicating the number of bytes in the payload, and to calculate the second value as a function of the subset of the payload and the length field.

10 73. The communications device of claim 72 wherein the frame further comprises a preamble having the first value appended to the beginning of the payload, and wherein the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, the processor further being configured to calculate the second value by exclusive or'ing the subset of the payload and the length field.

15 74. The communications device of claim 72 wherein the processor is further configured to determine whether the number of payload bytes indicated by the length field exceeds a threshold, the valid payload detection by the processor further being a function of the length field determination.

20 75. The communications device of claim 71 wherein the frame including the payload comprises a plurality of bytes, the receiver further being configured to receive the frame in a serial byte stream, and wherein the processor is further configured to determine whether all the payload bytes are received within a predetermined time from receipt of the
25 first payload byte, the valid frame detection by the processor further being a function of the payload byte determination.

30 76. The communications device of claim 75 wherein the processor is further configured to identify a length field in the frame indicating the number of bytes in the payload, the payload byte determination being a function of the length field indication.

77. The communications device of claim 74 wherein the frame including the payload comprises a plurality of bytes, the receiver further being configured to receive the frame in a serial byte stream, and wherein the processor is further configured to count the number of payload bytes received within a predetermined time, and declare an invalid frame if the payload byte count within the predetermined time is below a threshold.

78. The communications device of claim 77 wherein the processor is further configured to recount the number of payload bytes received within a second predetermined time if the payload byte within the predetermined time exceeds the threshold.

79. The communications device of claim 71 wherein the first value is appended to the beginning of the payload, the frame further comprising a third value appended to the end of the payload, the processor further being configured to calculate a fourth value as a function of a second subset of the payload, and compare the fourth value to the third value, the valid payload detection by the processor being a function of both the comparison of the first value to the second value and the comparison of the third value to the fourth value.

80. The communications device of claim 79 wherein the payload comprises a plurality of bytes, the processor further being configured to identify a length field in the frame indicating the number of bytes in the payload, the calculation of both the second and fourth value by the processor being further a function of the length field.

81. The communications device of claim 80 wherein the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the second subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble and the last byte of the payload.

82. The communications device of claim 81 wherein the processor is further configured to calculate the second value by exclusive or'ing the subset of the payload and the length field, and calculate the fourth value by exclusive or'ing the second subset of the payload and the length field.

83. The communications device of claim 71 wherein the receiver comprises a wireless receiver.

84. The communications device of claim 83 wherein the receiver comprises a code division multiple access receiver.

85. The communications device of claim 71 wherein the processor is further configured to delimit second frame boundaries of a second payload, calculate a third value as a function of a second subset of the second payload, and append the third value to the payload within the second frame boundaries, the communications device further comprising a transmitter configured to transmit the processed second frame.

86. The communications device of claim 85 wherein the transmitter comprises a wireless transmitter.

87. The communications device of claim 86 wherein the transmitter comprises a code division multiple access transmitter.

88. A communications device, comprising:
means for delimiting frame boundaries of a payload;
calculation means for calculating a value as a function of a subset of the payload; and
appending means for appending the value to the payload within the frame boundaries.

89. The communications device of claim 88 wherein the appending means appends a preamble to the beginning of the payload, the preamble having the value.

90. The communications device of claim 89 further comprising second calculation means for calculating a second value as a function of a second subset of the payload, and second appending means for appending the second value to the end of the payload within the frame boundaries.

91. The communications device of claim 90 wherein the payload comprises a plurality of bytes, and wherein the appending means disposes in the preamble a length field which indicates the number of bytes in the payload, and the second calculation means
5 calculates the second value as a function of the second subset of the payload and the length field.

92. The communications device of claim 91 wherein the second subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and
10 the last byte of the payload, and wherein the second calculation means calculates the second value by exclusive or'ing the second subset of the payload and the length field.

93. The communications device of claim 89 wherein the payload comprises a plurality of bytes, and wherein the appending means disposes in the preamble a length field
15 which indicates the number of bytes in the payload, and the calculating means calculates the value as a function of the subset of the payload and the length field.

94. The communications device of claim 93 wherein the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and wherein
20 the calculation means calculates the value by exclusive or'ing the subset of the payload and the length field.

95. A communications device, comprising:
means for identifying a frame having a payload with a first value appended
25 thereto;
calculation means for calculating a second value as a function of a subset of the payload;
comparison means for comparing the second value to the first value; and
detection means for detecting a valid payload as a function of the comparison.
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96. The communications device of claim 95 wherein the payload comprises a plurality of bytes, the communications device further comprising means for identifying a

length field in the frame indicating the number of bytes in the payload, wherein the calculation means calculates the second value as a function of the subset of the payload and the length field.

5 97. The communications device of claim 96 wherein the frame further comprises a preamble having the first value appended to the beginning of the payload, and the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and wherein the calculation means calculates the second value by exclusive or'ing the subset of the payload and the length field.

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98. The communications device of claim 96 further comprising means for determining whether the number of payload bytes indicated by the length field exceeds a threshold, and wherein the detection means detects a valid payload further as a function of the length field determination.

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99. The communications device of claim 95 wherein the frame including the payload comprises a plurality of bytes, the communications device further comprising means for receiving the frame in a serial byte stream, and means for determining whether all the payload bytes are received within a predetermined time from receipt of the first payload byte, wherein the detection means detects a valid payload further as a function of the payload byte determination.

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100. The communications device of claim 95 wherein the frame including the payload comprises a plurality of bytes, the communications device further comprising means for receiving the frame in a serial byte stream, means for counting the number of payload bytes received within a predetermined time, and means for declaring an invalid frame if the payload byte count within the predetermined time is below a threshold.

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101. The communications device of claim 100 further comprising means for recounting the number of payload bytes received within a second predetermined time if the payload byte within the predetermined time exceeds the threshold.

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102. The communications device of claim 95 wherein the first value is appended to the beginning of the payload, the frame further comprising a third value appended to the end of the payload, the communications device further comprising second calculation means for calculating a fourth value as a function of a second subset of the payload, and second comparison means for comparing the fourth value to the third value, wherein the detection means detects a valid payload as a function of both the comparison of the first value to the second value and the comparison of the third value to the fourth value.

103. The communications device of claim 102 wherein the payload comprises a plurality of bytes, the communications device further comprising means for identifying a length field in the frame indicating the number of bytes in the payload, the calculation means and the second calculation means each calculating its respective second and fourth further as a function of the length field.

104. The communications device of claim 103 wherein the subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble, and the second subset of the payload comprises the third, fourth and fifth bytes of the payload following the preamble and the last byte of the payload.

105. The communications device of claim 104 wherein the calculation means calculates the second value by exclusive or'ing the subset of the payload and the length field, and the second calculation means calculates the fourth value by exclusive or'ing the second subset of the payload and the length field.